CS208

Wed., 12 Apr. 2023

x 0x1234ABCD

31 32 1 0

0001 0010 0011 0100 1010 1011 1100 1101

& 0 ——— 0 1000

0000 ——— 0000 1000

Is bit 3 in x a 1 or not.

```
if (x88 != 0) { ... }
```

x 0xABCD1234

1010 1011 1100 1101 0001 0010 0011 0100

0 ——————————————— 0001 1000

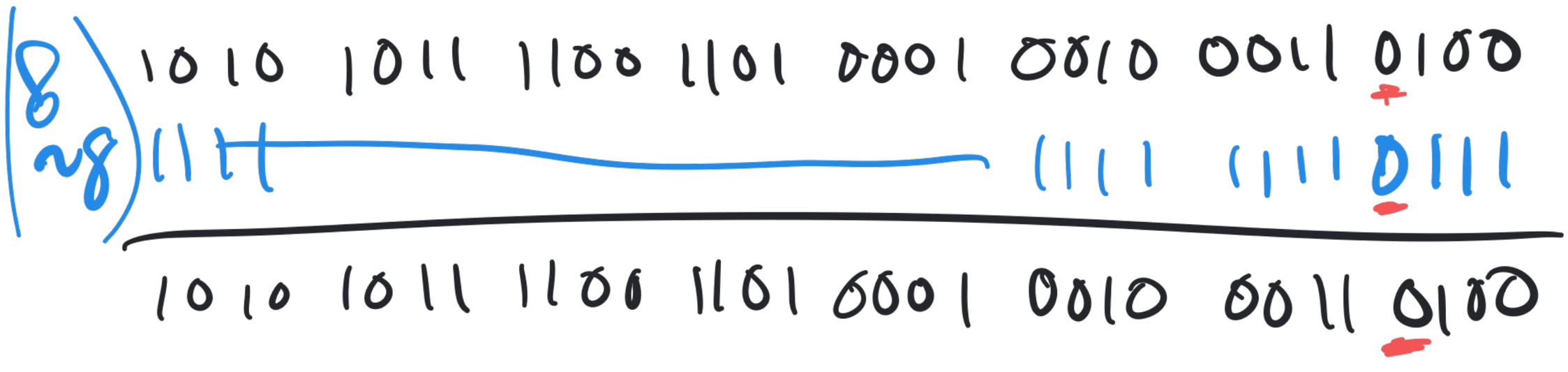
or

1010 1011 1100 1101 0001 0010 0011 1100

Turn on bit 3

(or leave it on)

× 0xABCD1234



Turns off bit 3
(or leaves it off)

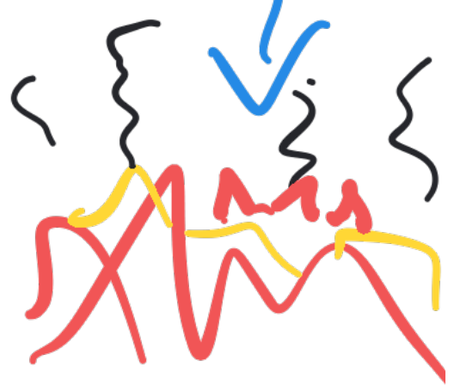
"masking"

x 0xABCD1234 >> 8

1010 1011 1100 1101 0001 0010 0011 0100

1111 1111 1010 1011 1100 1101 0001 0010

0xFFABCD12



unsigned 0xABCD1234 >> 8

1010 1011 1100 1101 1001 0010 0011 0100

0000 1001

0x00ABCD12

```
int n = 4;
int x = (1<<n);
```

00 ——————————— 01

4

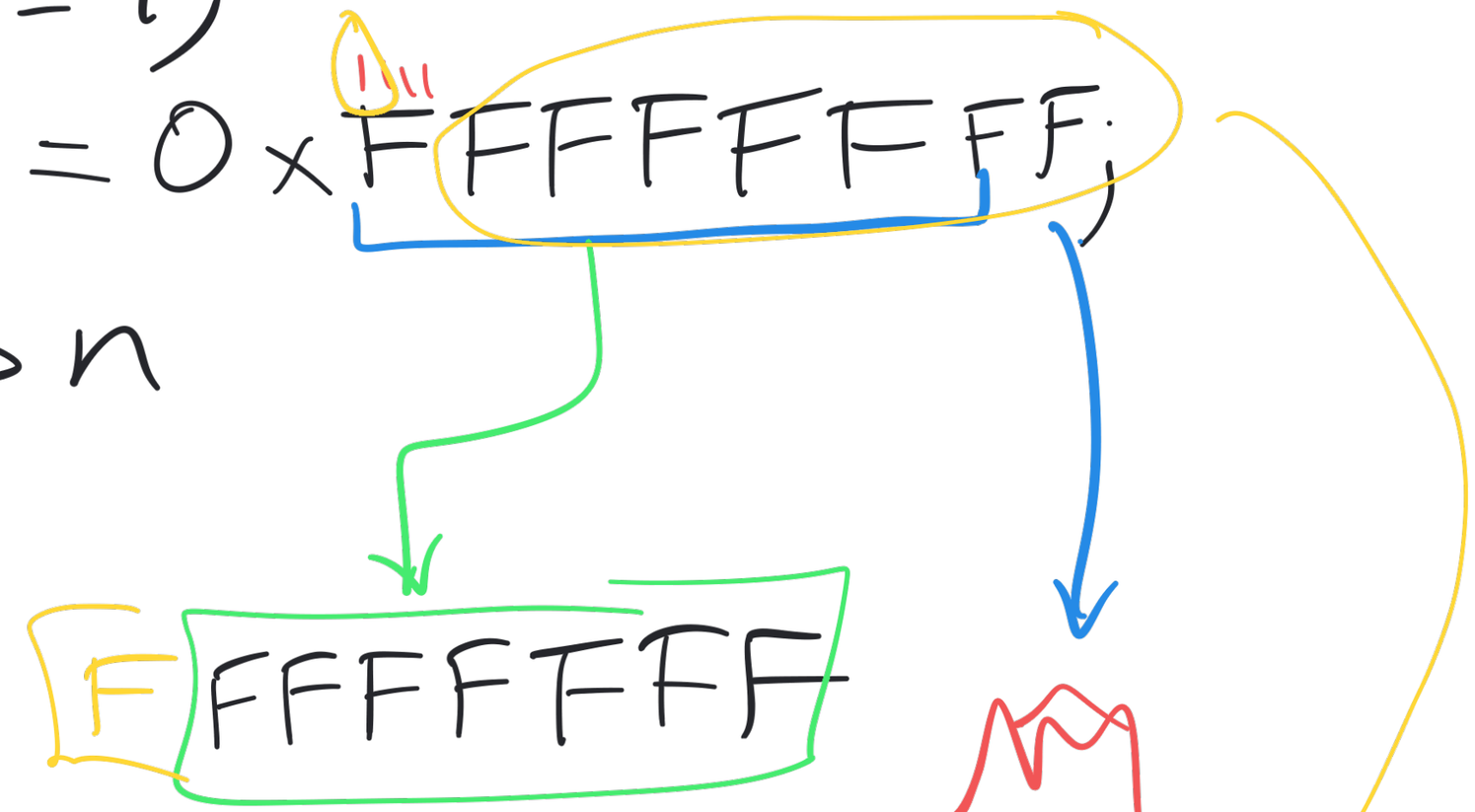
00 ——————————— 010000

```
if(x&(1<<4)!=0){
    // bit 4 of x is on
}
```

int n = 4;

int y = 0xFFFFFFFF;

y >> n



y << n

FFFFFFF0

```
int n=4;
unsigned int y = 0xFFFFFFFF;
```

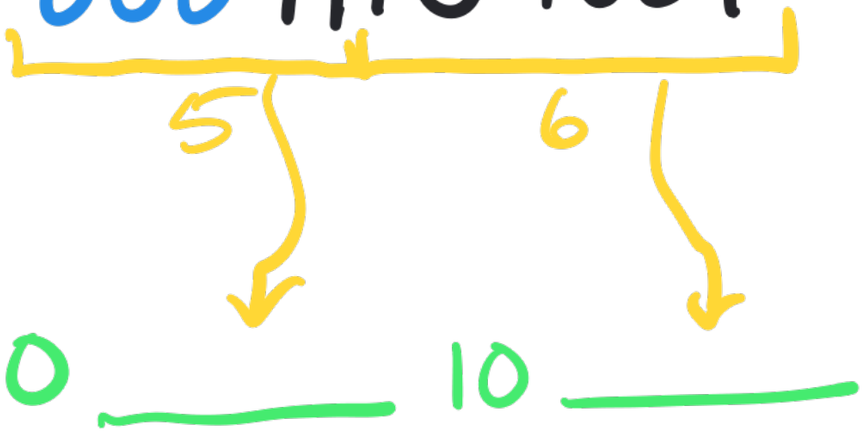
```
y>>4
```

0FFFFFFF

(this # could be used w/ & to mask the leftmost 4 bits of some #)

codePoint 0xE9

000 1110 1001



11000011 10101001

0xC3 0xA9

Ken Thompson (w/ D. Ritchie)

Turing Award 1983

Invented Unix

"Reflections on Trusting Trust"

Plan 9 OS

Go language)

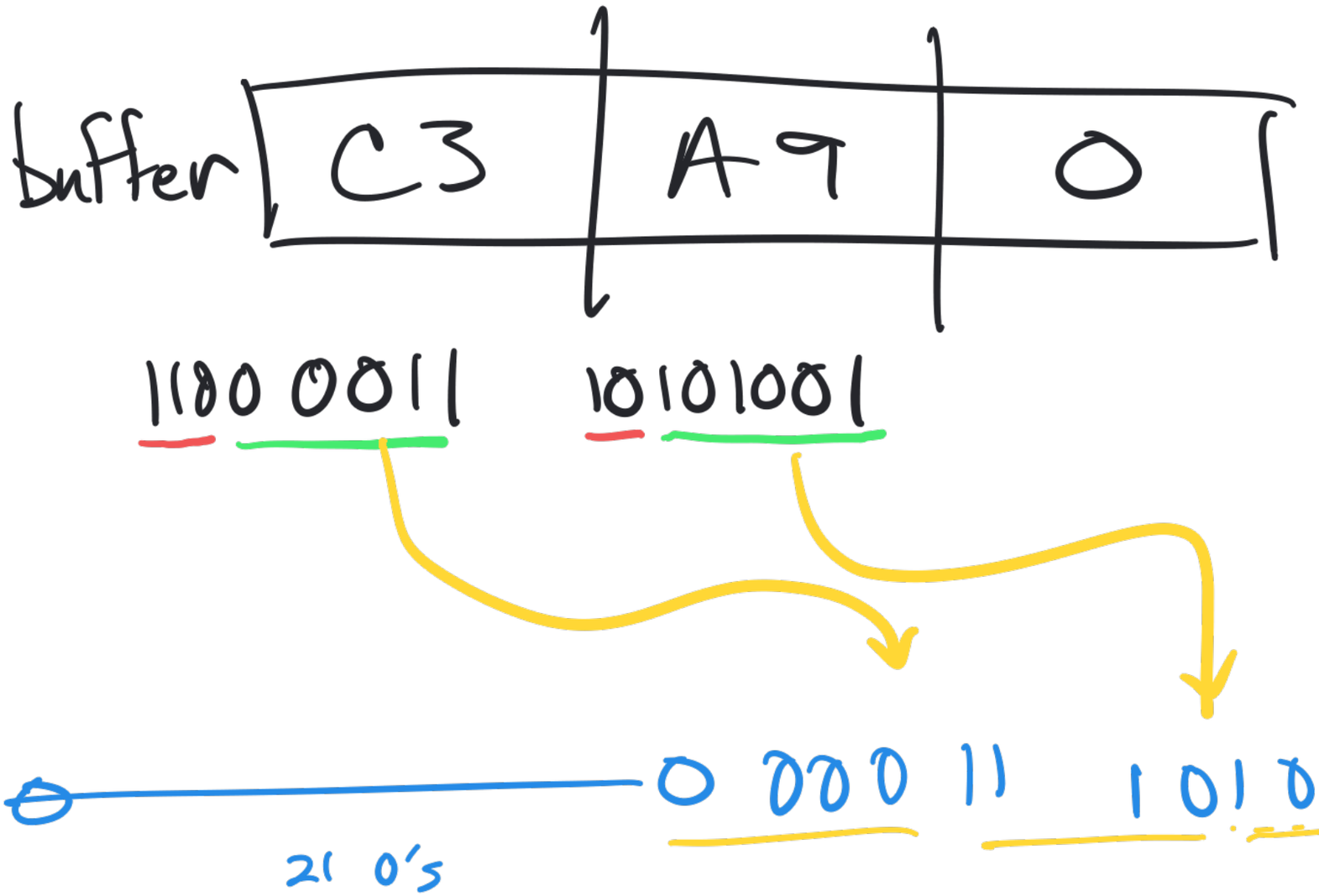
~1990

Unicode encodings had problems

- packed w/ null bytes
- endian-ness
- corrupted byte stream can't be resynchronized

UTF-8

Given


buffer
C3
A9
0
11001011
10101001
0 000 11
101001
21 0's
(0x00000 0 E9)